



PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in and relating to Pressure Sealing Devices at the Inlet or Outlet Points of a High Pressure Steamer

5 We, BENTELER-WERKE AKTIENGESELLSCHAFT, a company organized under the laws of Germany, of Weidenstrasse 10—16, Bielefeld, Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to pressure sealing devices at the inlet or outlet points of a high pressure steamer or the like for the treatment of webs of material, particularly webs of textile material, by a continuous process, the web of fabric being passed through between two rotatably mounted rollers under a clamping pressure.

15 According to the invention a pressure sealing device which is of nozzle-like construction and provided with a slit passage, is brought to a point close to, or directly against, the sealing rollers of the steamer, with the interposition of elastic sealing lips, so that the sealing lines lie on mutually facing circular sectors of the rotatable sealing rollers. This arrangement has the effect that at all times less than one-quarter of the periphery of the sealing rollers is exposed to the action of the steam passing out of the high pressure steamer (which would be detrimental), so that the sealing rollers have a substantially longer life than hitherto. The sealing lines can be brought so close to the sealing rollers that they are almost to the squeezing gap formed at the contacting line of the rollers, so that only a narrow passage space exists for the web of fabric, and at any one moment only a very small surface of each roller is exposed to the detrimental action of the steam. The risk of corrosion of the sensitive roller surface is thus substantially reduced, and it is possible for the rollers above the high pressure steamer to be cooled so that the heated roller surfaces, which according to the invention are relatively narrow, are immediately cooled. The heat of the steam thus

cannot spread out over the entire roller surface, since the proportions of cold zones to hot zones are substantially more favourable than with pressure sealing devices hitherto known.

Examples of the invention are illustrated in the accompanying drawings, in which:

Figure 1 shows in section, a diagram of the pressure sealing device according to the invention:

Figure 2, one end of a roller shown in Fig. 1, in front elevation;

Figure 3, another embodiment of a sealing device according to the invention illustrated diagrammatically;

Figure 4 a third embodiment of a sealing device according to the invention illustrated diagrammatically;

Figure 5 a front elevation, partly broken away, of the embodiment illustrated in Fig. 4: and

Figure 6 yet another embodiment of sealing device according to the invention.

Referring to the aforesaid drawings, above a high pressure steamer 1, (which may be of known type and of any desired construction), and in front of the inlet or outlet adjacent to which a pair of guide rollers 2 is disposed, lies a housing 3 in which the entire, preferably removable and replaceable, pressure sealing device is disposed.

The pressure sealing device comprises two sealing rollers 4 and 5, of which the sealing roller 5 is mounted fast but rotatably in the housing 3, on ball-bearings. The sealing roller 4 on the other hand is mounted in bearing arms 6 and forms the pressure roller, since it is continuously pressed in the direction of the roller 5 as shown by the arrow A. The bearing arms 6 carry roller bearings 7 and are themselves rockable about a fixed point 8, while at their upper end they are articulated to piston rods 9, which in turn are continuously pressed in the direction of the arrow A

by pressure pistons 10 working in cylinders 11. The cylinders 11 function uniformly and press the bearing arms 6 and hence the roller 4 continuously in the direction of the fixed roller 5.

The web of fabric 12 is either introduced from above, or withdrawn from the bottom of the casing 3 and passes through the squeezing gap formed by the sealing rollers 4 and 5, at the same time running through the steamer attachment 13 which is of nozzle-like construction with a slit passage. To the right and to the left of the rollers 4 and 5 are located plates 14 which are continuously pressed towards the end faces of the sealing rollers 4 and 5 by pistons 15 which are controlled hydraulically or pneumatically, and each of which is housed in a cylinder 16. Sealing at both ends of the rollers is thus achieved, while in each case a seal 17 is disposed between the steamer attachment 13 and the plate 14. The pressure of the plates 14, is controlled from a high pressure steam tank, exactly like the pressure of the sealing roller 4 against the sealing roller 5, that is to say the pressure in the cylinders 11, which is likewise controlled from the pressure tank.

The steamer attachment 13 can be of any desired construction, as shown in the various embodiments indicated as examples.

In Fig. 1 a steamer attachment 13 having a nozzle-like section is shown, which is provided with resilient sealing lips 18, which lie above supports 19, while between the supports 19 and lips 18 an annularly closed pressure tube 20 is preferably disposed, so that when the pressure in the tube 20 is increased or reduced the sealing lips 18 are pressed with greater or less force against the rollers 4 and 5. The sealing lips 18 are preferably of softer material than the roller coverings. The sealing lips 18 are situated in such a manner that they are pressed into contact in the mutually facing lower sectors of the rotatable sealing rollers 4 and 5. The pressure body 20 may alternatively be disposed at a different point on the steamer attachment, e.g. beneath the attachment 13 as shown in Fig. 6, in which case the supports 19 are unnecessary.

Fig. 3 shows by way of example another embodiment in which instead of the sealing lips 18, steel rollers or steel tubes 21 of relatively small diameter are provided which are mounted rotatably or non-rotatably in respective bearings 22 and, like the sealing lips 18, are under the pressure of a hydraulic or pneumatic pressure tube 20. These steel rollers or tubes 21 may also be sealed at the sides by plates 14, which, however, at the level of the steel rollers 21, have seals engaging there around after the manner of caps and let into the plates.

Fig. 4 shows by way of example another embodiment in which the entire steamer attachment 13 is preferably of steel and ex-

tends up to the rollers 4 and 5. As can be seen from Fig. 5, there may be provided a pressure plate 23, pressed by a piston 24, through a piston rod 25 and a two-armed lever 26, continuously in the direction of the pair of rollers 4 and 5. The entire steamer attachment 13 is rockable in the directions of the arrows B since on both sides it rests in a ball socket 27 on the two-armed lever 26. When the two-armed lever 26 receives pressure, the steamer attachment 13 is pressed against the rollers 4 and 5 and can rock about the axles 32 disposed on both sides and mounted in respective slide guides. The rockability is important, since in course of time the rollers 4 and 5 will wear.

In the embodiment illustrated by way of example in Fig. 4 the steamer attachment 13 is also provided with a steel bellows 28 closed on all sides, so that an upward and downward movement is possible without loss of pressure.

In an alternative construction the steamer attachment 13 may be mounted in vertical guides and a seal provided for the latter.

It will be seen that in the abovedescribed constructions the heating zone for the roller 4 and 5 is relatively small, but nevertheless for safety's sake cooling rollers 29 may be provided beneath each of the rollers, and a scraper 30 likewise provided to remove any roughness or dirt from the roller surfaces and keep them in good condition.

As can be seen from the embodiment described by way of example, the invention may take the most diverse concrete forms, while in addition all features of the individual embodiments are interchangeable.

WHAT WE CLAIM IS:—

1. A pressure sealing device at the inlet or outlet point of a high pressure steamer or the like for treating webs of fabric, particularly webs of textile fabric, in a continuous process, involving the passage of a web of fabric between two rotatably mounted sealing rollers under clamping pressure, comprising an attachment of nozzle-like construction having a slit passage located close to or in contact with the rollers, and provided with sealing lips or the like which cooperate with the rollers, and are so located that the sealing lines lie along the mutually facing circular sectors of the rotatable sealing rollers.

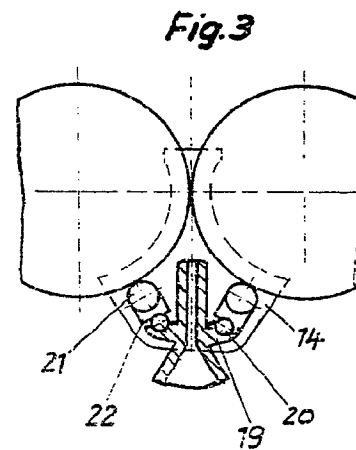
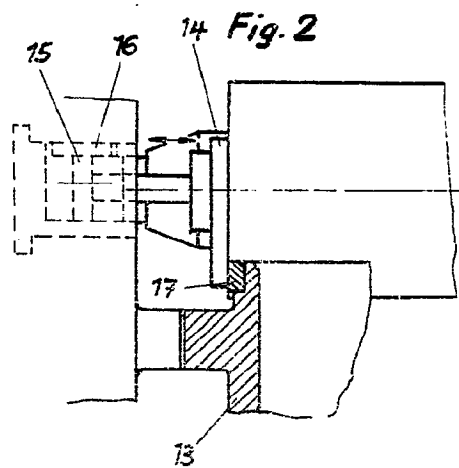
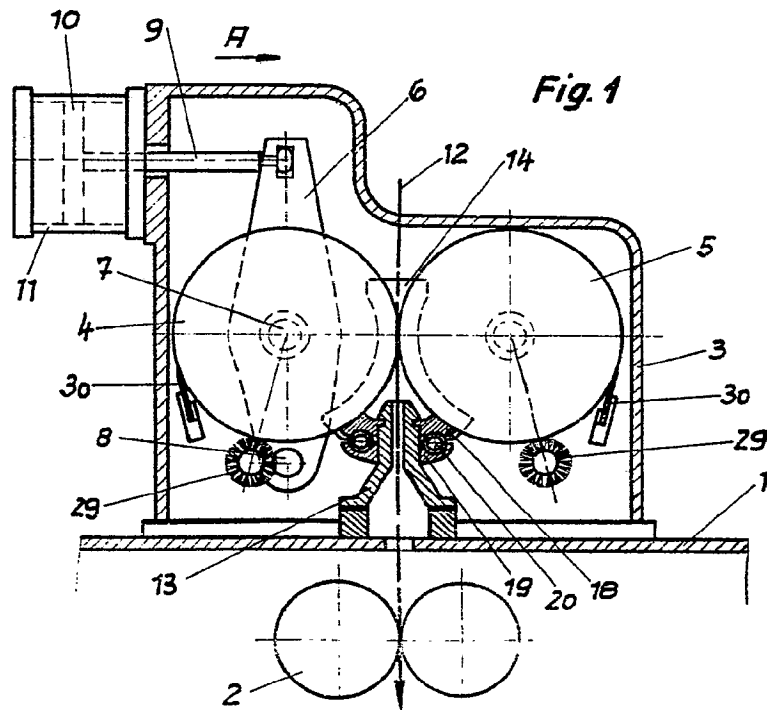
2. A pressure sealing device as claimed in Claim 1, wherein the end faces of the rollers and the steamer attachment are sealed by plates under hydraulically or pneumatically controlled pressure.

3. A pressure sealing device as claimed in Claim 2 comprising a seal between the steamer attachment and the plates.

4. A pressure sealing device as claimed in Claim 2 or 3 wherein the pressure of the plates is controlled from the high pressure steam tank.

5. A pressure sealing device as claimed in any of Claims 1 to 4 wherein one roller is rockably mounted in bearing arms and urged towards the other roller under a pressure which is controlled through one or more cylinders under the control of the high pressure steam tank. 30
6. A pressure sealing device as claimed in any preceding claim comprising cooling rollers at the periphery of the sealing rollers. 35
7. A pressure sealing device as claimed in any preceding claim comprising scrapers adjacent to the periphery of the rollers. 40
8. A pressure sealing device as claimed in any preceding claim wherein the attachment is provided with sealing lips mounted on supports fitted with a hydraulic or pneumatic pressure tube, which is preferably annularly closed. 45
9. A pressure sealing device as claimed in any of Claims 1—7 wherein the attachment itself is mounted on a pressure cushion. 50
10. A pressure sealing device as claimed in any preceding claim wherein the sealing lips are of resilient material.
11. A pressure sealing device as claimed in any of Claims 1—9 wherein the attachment is formed with supports mounting bearings for steel rollers, and fitted with a hydraulic or pneumatic pressure tube.
12. A pressure sealing device as claimed in any of Claims 1—9 wherein the attachment rides against the rollers and is pressed hydraulically or pneumatically towards the squeezing gap, between the rollers, by a closed bellows device located between a pressure plate of the attachment and the pressure steamer.
13. A pressure sealing device as claimed in any of Claims 1—9 wherein the attachment is pressed directly against the rollers by a control piston fitted with a piston rod connected to a two-armed lever, the attachment being movably mounted by a ball socket on the two-armed lever, and rockable about a shaft mounted in a slide guide.
14. A pressure sealing device at the inlet or outlet of a fabric web pressure steamer, substantially as described herein with reference to the accompanying drawings.
- W. H. BECK, GREENER & CO.,
Chartered Patent Agents,
7 Stone Buildings, Lincoln's Inn,
London, W.C.2.
Agents for the Applicants.

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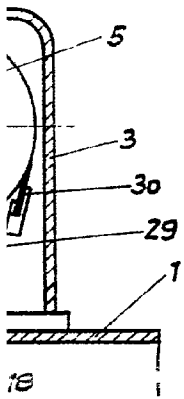


Fig. 3

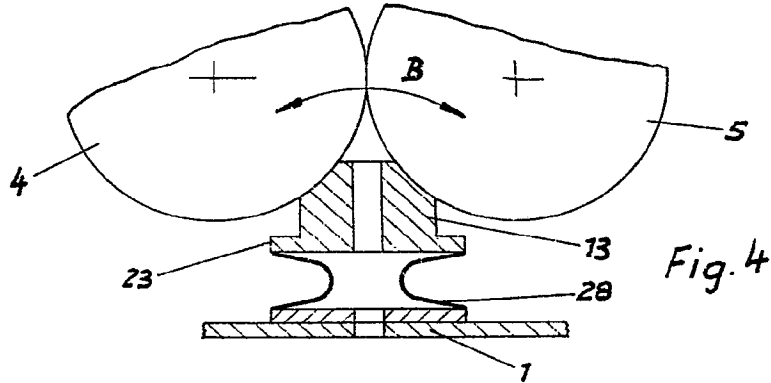
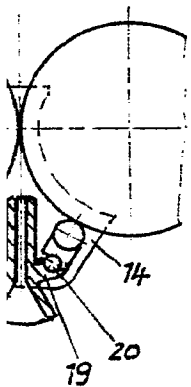


Fig. 4

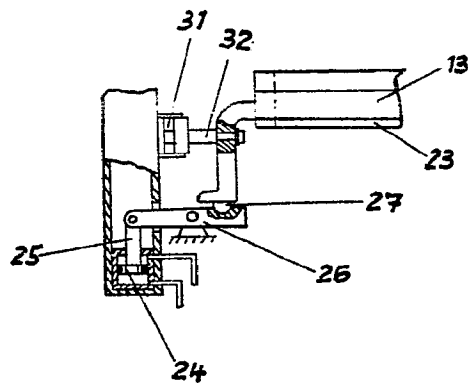


Fig. 5

Fig. 6

